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ABSTRACT

While the computer is commonly viewed as a tool for simplifying and enriching lives, many individuals react to this technology with feelings of anxiety, paranoia, and alienation. These reactions may have potentially serious career and educational consequences. Fear of computers reflects a generalized fear of current technology and is most prevalent in already-anxious individuals who are forced to deal with computers, especially in subordinate roles. External locus of control has also been identified as a predictor of computer anxiety. Teaching strategies relevant to alleviating students' computer anxiety might include the following: explanation of the logistics and functions of computer components; teaching the function of computers by using a set of rules; using several strategies to lower students' frustration levels; having the beginner adopt a computer mentality, in which orderliness, sequencing, and attention to detail are paramount to successful human/computer interactions; and insuring that early assignments incorporate tasks that are relevant to students' educational goals. Seventeen references are listed. (LMM)

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Computer Anxiety and Instruction

A paper presented at the Spring 1984 meetings of the Southeastern Psychological Association

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Technological advancements, especially in the area of electronic intelligence, have had a burgeoning effect on our lives over the past decade. With lower costs and more diverse applications, the computer's presence will be felt even more keenly in the years to come. Most of us welcome the computer with the innovations it has brought in such fields as science, medicine, business, industry and education. On a more personal level, computerized gadgetry allows our cars to run more efficiently, helps us prepare our meals, educate our children and keep us entertained in the evening. While most of us view this technology as a tool for simplifying and enriching our lives, there are many individuals who react with feelings of anxiety, paranoia and alienation, reactions which may have very serious career and educational consequences.

Industrial consultants (Poppel, 1980) estimate that a third of all people in information management occupations react with wariness to the arrival of a computer in the work setting and perhaps for a third of these the anxiety can be debilitating. Picture the 45-year-old manager or executive assistant with 20 years of tenure with the company, arriving at work one day to discover a computer terminal on his desk, and teams of technicians stringing cables everywhere. With no typing skills, and a long-standing opinion that such tasks are the exclusive responsibility of the clerical staff, he feels humiliated just facing the keyboard. His first encounter with the electronic monster reflects a climax in the ongoing struggle he has suffered concerning all technological advancements. He has been unwilling and perhaps unable to keep abreast of the technologies relevant to his occupation, feeling or hoping that computers were just another fad that would pass. For years he would grow nauseous at hearing the computer jargon and terminology being used by friends and colleagues. After all, those people who spend all of their time with computers represent some lower social status if they can be considered social at all. And now he is made to feel totally inept, forced to interact with this machine in full view of his colleagues. Visions of revenge and subversion cloud his thinking; those who are responsible for this contraption will soon realize that we will be much better off without it. As he commutes home that evening, he comes to realize that the computer reflects just one more way for the people on the top floor to further their control of his life. With all of his work in the computer system, to which everyone now has access, there are no excuses, no escape. And with this access, what need do the top executives have for his job at all?

Arriving home he is greeted by a stack of bills, five copies of the same catalogue and several so-called, personalized letters soliciting donations all of which are the results of computers. At dinner his daughter relates with glee her experiences with the computers at school that day, and his son recounts his latest accomplishments at the video arcade. Later, a television special

refers to the growing need for computer literacy; how dare they use the term literacy in reference to those moronic machines.

As time passes his feelings toward the computer grow even more bitter. Instead of a constructive tool, the computer is viewed as a temperamental, powerful, inhuman, controlling entity which has only served to complicate his work tasks. Before the computer, he alone was responsible for the products of his work-efforts. Now the computer system is, yet he gets the negative performance appraisal if his product does not meet specifications, Intrinsic to all of these reactions is the sense of losing control over his job-tasks and of his life in general.

This caricature I have presented of the typical computer-phobic reflects many of the factors associated with this problem as described by Bralove (1983), Cancro and Slotnick (1970), Ingber (1981), Jay (1981), Lawton and Gerschner (1982), and Lee (1970). Fear of computers reflects a generalized fear of current technology and is most prevalent in individuals who are highly anxious to begin with and forced to deal with computers especially in subordinate roles. The highly rational functioning of a computer can be very dehumanizing to a person whose job-tasks or class schedule is dictated by a computer. Such emotional reactions can result in attempts at subversion, loss of production, absenteeism and feelings of alienation. Consulting firms ("How to Conquer," 1982) note that many initial installations of computer facilities are poorly planned and insufficiently adapted to the specific work setting which only served to reinforce the beliefs of computer phobics. Combine this problem with other functional difficulties of a new system, and poorly trained users, the novice's initial attempts to interact with the computer are likely to meet with failure. Such repeated failures may result in learned helplessness (Seligman, 1975), the frustrating feeling of being powerless to control the seemingly random activities of the computer.

According to Coovert and Goldstein (1980) one of the best predictors of attitudes toward computers is Rotter's (1966) perceived measure of locus of control. According to their research, externalizers or people who perceive events in their lives as being out of their personal control, are the most likely candidates to experience computer anxiety. Externalizers are more likely to make statements implying that the computer controls them rather than the reverse. This finding is compatible with the locus of control literature in general which suggests that people with an external locus are more likely to have elevated levels of anxiety, especially when their personal adequacy is being challenged (Speilberger, O'Neil and Duncan, 1972). According to Schill, Ramanaiah and Toves (1982) even highly internal people can become defensively external in anxiety-provoking situations which can result in even higher levels of stress since these defenses prevent a person from seeking appropriate assistance.

What solutions exist for these problems? As one who teaches statistical applications of the computer to graduate students in school psychology most of whom are without prior computer experience, I would like to aim my comments at teaching strategies relevant to alleviating computer anxiety. These strategies are an outgrowth of the literature on computer anxiety and my own experiences dealing with the problem. I do not pretend any empirical basis for the effectiveness of these strategies.

1) First, as Ringle (1981) has pointed out, those who learn to use the computer by doing specific tasks and do not understand the overall configuration or functioning of the computer are likely to develop a kind of blind trust or dependency on the computer and computer personnel, resulting in anxiety about the validity of the results and frustration when things do not work as planned. With this in mind, I begin the computer portion of the course with a general explanation of the logistics and functioning of each component of the computer. As regards the functioning of the monitor, the overall design and function of the various routines and subroutines are described before any specific user-skills are taught. I frequently use analogies to describe the various subroutines of the computer monitor and their relationships to one another. For example the various routines of the text editor as described as rooms of a house, each with its own specific functional properties including a scheme one can use to get from one room to the next.

2) Since computer anxiety is related to the perception of external control, and since Daniels and Stevens (1976) and Horak and Horak (1982) have shown that externalizers learn best with deductive, rule-oriented teaching strategies, I teach the functioning of the monitors by means of a set of rules which students memorize in a rote fashion and can use whenever they cannot complete a task. Using the analogy of rooms just mentioned, I rehearse with students a set of questions they can ask themselves such as: 1) What is the nature of the task at hand? 2) Which room is capable of executing that task? 3) What rooms are you in now? and 4) How can I get to the appropriate room? Having a set of memorized rules to fall back on serves as a kind of security blanket or problem solving strategy for the highly anxious student.

3) It is important to use several strategies to lower frustration levels in the students. Realizing that human/computer interactions are seldom successful for first attempts at new tasks even for experienced users, I try to instill in the students the idea that repeated failure is part of the normal process of using the computer. I encourage them to take a very bold approach to using the computer, to make mistakes and learn from those mistakes and realize that adapting to the computer does require a great deal of frustration tolerance for the beginner. I ask them to notice that experienced users all seem to have in common a high degree of frustration tolerance. I try to model that type of behavior myself. Reducing student frustration also requires that the initial assignments be crystal clear and the instructions regarding the use of the computer facilities be appropriately sequenced and sufficiently detailed. Initial success experiences with the computer can serve to immunize one against a "learned helplessness" type of reaction (Seligman, 1975).

4) It is important that the beginner adopt a computer mentality where orderliness, sequencing and attention to detail are paramount to successful human/computer interactions. Requiring this mode of performance on earlier non-computer assignments encourages the development of appropriate habits. Instructional handouts provided for the students also model these characteristics. Providing a rationale from the computer's perspective for each semi-colon, slash or other detail allows the student to understand the need for these things.

5) From a motivational perspective, it is critical that early assignments incorporate tasks that are very relevant to the educational goals of the students allowing them to see a very real advantage of the use of this tool. Typically, I assign them a statistical problem which they had calculated by hand earlier in the course so that they can fully appreciate the savings in time and effort. I also teach a variety of non-statistical applications relevant to their profession to encourage them to view the computer as a very usetul tool.

These teaching strategies do require a great deal of effort on the part of the instructor especially in regard to devising detailed instructional handouts for a computer facility which seems to change its operating procedures all too frequently. There is a real danger in this approach of fostering an infantile dependency on the guidance of the instructor. Consequently as students mature with each accomplishment it is important to wean them from instructional handouts on to statistical guides and computer manuals. Usually this process occurs naturally as students develop self confidence and a sense of control over the computer. Regardless, independence should be fostered by assignments which require novel applications of the computer.

Success as a teacher of basic computer skills can be defined as students' willingness to use the computer for professional tasks after the course is over. I am happy to report that my success rate has improved markedly after reviewing the literature on computer anxiety and developing the strategies I have just described.

References

Bralove, M. (1983, March 7). Computer anxiety hits middle management. Wall Street Journal, p. 22.

Cancro, R., & Slotnick, D. (1970). Computer graphics and resistance to technology. American Journal of Psychotherapy, 24, 461-469.

Coovert, M. D. & Goldstein, M. (1980). Locus of control as a predictor of users' attitude toward computers. Psychological Reports, 47, 1167-1173.

Daniels, R. L., & Stevens, J. P. (1976). The interaction between the internal-external locus of control and two methods of college instruction. American Educational Research Journal, 13(2), 103-113.

Horak, V., & Horak, W. (1982). The influence of student locus of control and teaching method on math achievement. Journal of Experimental Education, 5, 18-21.

How to conquer fear of computers. (1982, March 29). Business Week, 176-178.

Ingber, D. (1981, July). Computer addicts. Science Digest, 88-91, 114.

Jay, T. B. (1981, January). Computerphobia: What to do about it. Educational Technology, 47-48.

Lawton, J., & Gerschner, V. T. (1982). A review of the literature on attitudes towards computers and computerized instruction. Journal of Research and Development in Education, 16, 50-55.

Lee, R. (1970). Social attitudes and the computer revolution. Public Opinion Quarterly, 34, 53-59.

Orcutt, J. D. & Anderson, R. E. (1977). Social interaction, dehumanization and the "computerized other." Sociology and Social Research, 61, 380-397.

Poppel, H. L. (1980) Managerial/professional productivity. Outlook, 3, 29-34.

Ringle, M. (1981, November-December). Computer literacy: New directions and new aspects. Computers and people, 12-15.

Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80 (1, Whole No. 609).

Schill, T., Ramanaiah, N., & Toves, C. (1982). Defensive externality and vulnerability to life stress. Psychological Reports, 51, 878.

Seligman, M. E. P. (1975). Helplessness. San Francisco: W. H. Freeman and Company

Spielberger, C. D., O'Neil, H. J., Jr. & Duncan, H. H. (1972). Anxiety, drive theory and computer-assisted learning. In B. A. Maher (Ed.), Progress in Experimental Personality Research, 6, 109-148.